NATURAL RESOURCES CONSERVATION SERVICE

CONSERVATION PRACTICE STANDARD

Clearing and Snagging

(Feet)

Code 326

DEFINITION

Removing snags, drifts, or other obstructions from a channel.

PURPOSES

To increase the flow capacity of a channel by improving its flow characteristics; to prevent bank erosion by eddies; to reduce the forming of bars; and to minimize blockage by debris and ice.

CONDITIONS WHERE PRACTICE APPLIES

Any channel or floodway where the removal of trees, brush, and other obstructions is needed to accomplish one or more of the listed purposes. If clearing and snagging are likely to result in channel erosion or impairment to the landscape resource quality, or impairment to habitat for fish and wildlife, either the clearing and snagging shall not be done or practices to minimize such damages shall be applied concurrently with the clearing and snagging.

CRITERIA

The capacity of the channel, both before and after improvement, shall be determined by use of Manning's Formula, using applicable values of the retardance factor "n", for both conditions. The value of "n" used to determine channel capacity after improvement shall reflect the degree of maintenance expected in future years.

The area to be cleared and snagged shall include the perimeter of the channel, the flow area of the floodway, or both. Adjacent trees or other objects that may fall into the channel shall also be included. Clearing and snagging may be specified for other areas, including berms, for use as temporary disposal areas or travelways, or for planned conservation uses.

Channel stability shall not be impaired by clearing and snagging. The criteria for determining channel stability in open channels (582) shall be complied with. The effect of removing obstructions on downstream reaches shall be considered.

CONSIDERATIONS

Effects on water quantity and quality shall be considered. Clearing and snagging will increase discharge, velocity and channel capacity which will reduce flood damage from out of bank flow by removing deadfalls, stumps, and trees from streambanks and channels. Downstream out of bank flow may increase. Improved flow conditions will lower hydraulic gradient and drain flood plains more quickly. Rapid drawdown may cause sloughing of saturated, unstable streambanks. Ground water recharge will be decreased in water in water-losing streams because of reduced residence time of the channel water. Transpiration may be decreased when vegetation is removed. Losses of aquatic or wetland habitat may occur.

This practice will have minor long-term impact on surface water quality. Reduced hazard from streambank erosion caused by diverted flow may

occur, but care must be taken that the practice would not induce channel bank sloughing due to instability. Channel instability could increase sediment yield from bank erosion until revegetated, then sediment yield normally decreases. During installation of the practice, there may be an increase in channel turbidity and yields of sediment and attached substances to downstream water courses. During construction, a heavy organic load may be produced. Long term effects may cause a decrease in yields of sediment and sediment attached substances. Increased surface water temperatures, at low flow, may occur from removal of shade producing canopy, but accelerated flows may reduce the period of sun warming. If the stream was carrying dissolved substances, a reduction in ground water recharge may contribute to improved aquifer quality. The number of pools and riffles forming the channel bottom will frequently be reduced and fish habitat would be adversely affected.

Special attention shall be given to maintaining and improving visual resources and habitat for fish and wildlife where applicable. The landowner/user will be advised if wetlands will be affected and USDA-NRCS wetland policy will apply. All work planned shall be in compliance with General Manual Title 450-GM, Part 405, Subpart A, Compliance With Federal, State, and Local Laws and Regulations.

PLANS AND SPECIFICATIONS

Plans and specifications for clearing and snagging shall be in keeping with this standard and shall describe the requirements for applying the practice to achieve its intended purpose.

Construction Specifications

General. Construction operations shall be carried out in such a manner and sequence that erosion and air and water pollution will be minimized and held within acceptable limits. Construction methods that enhance fish and wildlife will be used where practical. Trees, stumps, and brush removed from the construction area may be piled for fish and wildlife habitat when approved by the landowner/user.

The completed job shall present a workmanlike appearance and conform to the line, grades, and elevations shown on the drawings or as staked in the field.

All operations shall be carried out in a safe and skillful manner. Safety and health regulations shall be observed and appropriate safety measures used.

Site preparation. All trees, stumps, and brush within the perimeter of the channel shall be cut as close to the ground as the cutting tools permit. If other areas are to be cleared, the trees, brush, and other woody vegetation shall be cut within the maximum distance above the ground level specified.

Special attention shall be given to protecting and maintaining key shade, food, and den trees, and visual resources. Trees to be left standing and uninjured within the clearing limits shall be marked. Removal of any trees and brush shall be done in such a manner as to avoid damage to other trees and property.

Down trees, logs, drifts, boulders, debris, and other obstructions lying wholly or partly in the channel shall be removed. Piling, piers, headwalls and sediment bars that obstruct the free flow of water shall be removed if so designated in the project plan.

If herbicide treatment is planned, the stumps and brush in the specified area shall be treated at the time of clearing according to the recommendations of the manufacturer of the herbicide specified or being used.

The use of explosives in all clearing and snagging operations shall be in strict compliance with applicable state statutes and regulations.

If channels are located in cultivated areas or in areas of high value land, trees, logs, and all combustible material resulting from the clearing and snagging operations shall be burned, buried, or piled in designated disposal areas as specified for the project. All burning shall be performed outside the channel and shall conform to regulations in effect in the area. In other areas, such as woodland or rangeland where burning is prohibited, material shall be disposed of in such

a manner that it does not float away or reenter the channel. Residue from burning and noncombustible material shall be buried outside the channel, placed in designated disposal areas, or removed from the site. All buried material shall have an adequate earth cover to permit proper land use.

Vegetative establishment

Vegetation will be established on all disturbed areas such as channel slopes, berms, spoil and other areas except when bank materials or land use conditions are such that vegetation is impractical. Trees and shrubs should be established where practical. Disturbed areas are to be final graded and seeded or planted to trees as soon as possible after exposure. Use daily seeding whenever possible. Planned trees and shrubs shall be established according to Technical Guide Specification 612 – Tree/Shrub Establishment.

Gullied and uneven areas will be smoothed before attempting to prepare seedbed.

Apply lime to raise the pH level desired for species of vegetation being seeded if needed. Rate of application should be determined by soil testing. If soil test recommendations are not available, a minimum of 2 tons/ac. should be applied.

Fertilize according to soil tests or at a minimum rate of 1000 lbs. of 12-12-12 fertilizer (or its equivalent) per acre as soon as the measure has been constructed within the seeding periods. Apply 150 lbs. per acre of ammonium nitrate 6 to 8 weeks after seeding on soils low in organic matter and fertility unless this time frame extends into an inactive growing period. In this event, the additional fertilizer should be applied during the next active growing period.

Work the fertilizer and lime into the soil to a depth of 2 to 3 inches with a harrow or disk. Prepare a firm seedbed with a cultipacker or cultipacker type seeder.

Seed one of the grass mixtures listed in Table 1 during the preferred seeding periods of March 1 to May 10 or August 10 to September 30.

Table 1. Clearing and Snagging Seed Mixtures

Species	Seeding Rate (PLS)*		Suitable	Site Suitability[1]		
Mixture	lbs/ac	lbs/1000 ft^2	pH	Droughty	Well-drained	Wet
1. Tall fescue	20	0.5	5.0 to 8.0	2	1	
Smooth bromegrass	20	0.5				
2. Reed canarygrass	18	0.4	3.5 to 7.5	2	1	1
3. Kentucky bluegrass	20	0.5				
Creeping red fescue	20	0.5	5.8 to 7.5	2	1	
4. Tall fescue	35	0.8	5.5 to 8.3	2	1	2

*PLS – pure live seed
[1]Site suitability: 1 – Preferred, 2 - Acceptable

When construction is completed between May 11 and August 9, a temporary cover crop should be established using one of the following:

Species	Minimum Rates
(1) Wheat	150 lbs/acre
(2) Rye	150 lbs/acre
(3) Spring Oats	100 lbs/acre
(4) Annual rye grass	20 lbs/acre
(5) Corn	150-300 lbs/acre

After August 10, temporary cover should be removed or incorporated, fertilizer applied, seedbed prepared and permanent seeding done in a normal manner.

When construction is completed between September 30 and March 1, prepare seedbed, fertilize and mulch according to recommendations. Seed should be applied over mulch sometime between December 1 and

March 1. When this seeding method is used, seeding rates should be increased by 50%.

On critical sites, mulch with 1-1/2 to 2 tons straw pre acre. Anchor the mulch with asphalt spray, netting or mulch anchoring tool. In areas such as sharps breaks in channel slopes or where excessive velocities could cause bank scour, paper netting, jute netting, rock lining, erosion control blankets or sod should be used.

Mixture 3 may be used in urban or similar areas where lower growing vegetation is desired and close mowing will be practiced. It also withstands shade better.

Where high banks will be infrequently flooded, 5 lbs/acre of crownvetch seed may be added to mixtures 1, 2, or 4.

OPERATION AND MAINTENANCE

A maintenance program shall be established by the landowner/user to maintain capacity and vegetative cover. Items to consider are:

1. Do not graze protected area during vegetative establishment and when soil conditions are wet.
2. Fertilize to maintain a vigorous vegetative cover. Caution should be used in fertilization to maintain water quality.
3. Periodically mulch, spray or chop out undesirable vegetation to prevent growth of large woody-stemmed weeds or water plants such as cattails or trees (e.g. willows) which impede flow.
4. Promptly repair eroded areas.
5. Remove silt and sediment accumulations in the channel cross-section as soon as practical to prevent buildup and growth of undesirable vegetation.
6. Reestablish vegetation cover immediately where scour erosion has removed established seeding.
7. Keep inlets to side drainage structures open.
8. Keep substance drain outlet pipes open and protected. Maintain animal guards in proper operation.
9. Periodically inspect area for signs of undermining or instability and, if any are observed, take immediate action to protect from further damage.